

### **REMARKS**

In response to the Office Action of July 13, 2007, applicants have amended the claims, which when considered with the following remarks, is deemed to place the present application in condition for allowance. Favorable consideration and allowance of all pending claims is respectfully requested. The amendments to the claims have been made in the interest of expediting prosecution of this case. Applicants reserve the right to prosecute the same or similar subject matter in this or another application.

Claims 1-35 are pending in this application. By this Amendment, Claims 1, 21, 32 and 33 have been amended. Support for these amendments can be found throughout the specification and claims. For example, the amendment to Claim 1 to recite "a major amount of a diesel fuel" can be found on page 4, lines 1-5 (which recites, *inter alia*, a fuel composition comprising (a) a major amount of a diesel fuel), page 14, lines 6-14 and in the examples. Applicants respectfully submit that no new matter has been added to this application. Moreover, it is believed that the claims as presented herein place the application in condition for allowance.

Initially, the Examiner's indication in the Office Action that Claims 25, 26 and 31 would be allowable over the prior art if rewritten in independent format including all of the limitations of the base claim and any intervening claim is noted with appreciation.

The Examiner has rejected Claims 32 and 33 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner has rejected Claims 32 and 33 as lacking antecedent basis for the recitation "the minor fuel economy improving effective amount". Claims 32 and 33 have been amended herein to recite "the effective amount" thus

obviating this rejection. Accordingly, withdrawal of the rejection of amended Claims 32 and 33 under 35 U.S.C. §112, second paragraph, is respectfully requested.

The Examiner has rejected Claims 1-6, 9-14, 17-24, 27-30 and 32-35 under 35 U.S.C. §103(a) as being obvious over Esche, Jr. et al. U.S. Publication No. 2004/0014612 ("Esche, Jr. et al. ").

Nowhere does Esche, Jr. et al. disclose or suggest a diesel fuel composition comprising, *inter alia*, "an effective amount of soot dispersant additive which is a copolymer of ethylene and a C<sub>3</sub> - C<sub>10</sub> alpha-monoolefin having a number average molecular weight ranging from about 5,500 to about 60,000 on which has been grafted an ethylenically unsaturated carboxylic acid and/or anhydride thereof in the ratio of at least about 1.8 molecules of carboxylic acid functions per molecule of said copolymer which is then further derivatized with at least one amino-aromatic polyamine compound selected from the group consisting of: (a) N-arylphenylenediamine ... (b) aminocarbazole ... (c) aminoindole ... (d) amino-indazolinone ... and (e) aminoperimidine" as generally recited in amended Claim 1.

In contrast to the presently claimed invention, and as acknowledged by the Examiner, Esche, Jr. et al. disclose a hybridized, acylated olefin copolymer obtained from the reaction product of (a) an acylated olefin copolymer, and (b) a polythiol amine such as an aminomercaptotriazole as a coupling compound. At no point is there any suggestion, motivation or even a hint in Esche, Jr. et al. of a grafted copolymer which is further derivatized with at least one amino-aromatic polyamine compound selected from the group consisting of: (a) N-arylphenylenediamine ... (b) aminocarbazole ... (c) aminoindole ... (d) amino-indazolinone ... and (e) aminoperimidine. In contrast, Esche, Jr. et al. simply disclose that an

aminomercaptotriazole could be employed in the coupling reaction. As such, nothing in Esche would lead one skilled in the art to modify the reaction product of a hybridized, acylated olefin copolymer and coupling agent such as an aminomercaptotriazole disclosed therein and arrive at the claimed soot dispersant additive which is a copolymer of ethylene and a C<sub>3</sub> - C<sub>10</sub> alpha-monoolefin having a number average molecular weight ranging from about 5,500 to about 60,000 on which has been grafted an ethylenically unsaturated carboxylic acid and/or anhydride thereof in the ratio of at least about 1.8 molecules of carboxylic acid functions per molecule of said copolymer which is then further derivatized with at least one amino-aromatic polyamine compound selected from the compound selected from the group consisting of: (a) N-arylphenylenediamine ... (b) aminocarbazole ... (c) aminoindole ... (d) amino-indazolinone ... and (e) aminoperimidine. Accordingly, Claim 1 is believed to be nonobvious, and therefore patentable, over Esche, Jr. et al.

With respect to amended Claim 21, Esche, Jr. et al. likewise nowhere disclose or suggest a method for improving the soot dispersancy in the crankcase lubricating oil during engine operation of a diesel engine which comprises operating the diesel engine with a fuel composition comprising, *inter alia*, "an effective amount of soot dispersant additive which is a copolymer of ethylene and a C<sub>3</sub> - C<sub>10</sub> alpha-monoolefin having a number average molecular weight ranging from about 5,500 to about 60,000 on which has been grafted an ethylenically unsaturated carboxylic acid and/or anhydride thereof in the ratio of at least about 1.8 molecules of carboxylic acid functions per molecule of said copolymer which is then further derivatized with at least one amino-aromatic polyamine compound selected from the group consisting of: (a) N-

arylphenylenediamine ... (b) aminocarbazole ... (c) aminoindole ... (d) amino-indazolinone ... and (e) aminoperimidine” as generally recited in amended Claim 21.

In contrast to the presently claimed invention, Esche, Jr. et al. disclose a hybridized, acylated olefin copolymer for use as a multi-functional fuel and lubricant additive which is obtained from the reaction product of (a) an acylated olefin copolymer, and (b) an aminomercaptotriazole as a coupling compound. Esche, Jr. et al. further disclose that the hybridized olefin copolymer products disclosed therein find their primary utility in lubricating oil compositions and goes on to state a method of improving the dispersancy of a lubricating oil by incorporating into the oil a dispersancy improving amount of the hybridized, acylated olefin copolymer.

Esche, Jr. et al., however, has no appreciation of a method for improving the soot dispersancy in the crankcase lubricating oil during engine operation of a diesel engine which comprises operating the diesel engine with a fuel composition comprising (a) a major amount of a diesel fuel and (b) an effective amount of the recited soot dispersant additive which is a grafted copolymer further derivatized with at least one amino-aromatic polyamine compound selected from the group consisting of: (a) N-arylphenylenediamine ... (b) aminocarbazole ... (c) aminoindole ... (d) amino-indazolinone ... and (e) aminoperimidine. In addition, as stated above, at no point is there any suggestion, motivation or even a hint in Esche, Jr. et al. of a grafted copolymer which is further derivatized with at least one amino-aromatic polyamine compound selected from the group consisting of: (a) N-arylphenylenediamine ... (b) aminocarbazole ... (c) aminoindole ... (d) amino-indazolinone ... and (e) aminoperimidine. In contrast, Esche, Jr. et al. simply disclose that an aminomercaptotriazole could be employed in the

coupling reaction. As such, nothing in Esche, Jr. et al. would lead one skilled in the art to modify the reaction product of a hybridized, acylated olefin copolymer and coupling agent such as an aminomercaptotriazole disclosed therein and arrive at the claimed soot dispersant additive which is a copolymer of ethylene and a C<sub>3</sub> - C<sub>10</sub> alpha-monoolefin having a number average molecular weight ranging from about 5,500 to about 60,000 on which has been grafted an ethylenically unsaturated carboxylic acid and/or anhydride thereof in the ratio of at least about 1.8 molecules of carboxylic acid functions per molecule of said copolymer which is then further derivatized with at least one amino-aromatic polyamine compound selected from the compound selected from the group consisting of: (a) N-arylphenylenediamine ... (b) aminocarbazole ... (c) aminoindole ... (d) amino-indazolinone ... and (e) aminoperimidine.

Also, nothing in Esche, Jr. et al. would lead one skilled in the art to modify the hybridized olefin copolymer reaction product disclosed therein which is obtained from the reaction of (a) an acylated olefin copolymer, and (b) an aminomercaptotriazole as a coupling compound and which improves the dispersancy of a lubricating oil by incorporating directly into the oil a dispersancy improving amount of the hybridized, acylated olefin copolymer and arrive at the presently claimed method for improving the soot dispersancy in the crankcase lubricating oil during engine operation of a diesel engine by operating the diesel engine with a fuel composition containing (a) a major amount of a diesel fuel and (b) an effective amount of the recited soot dispersant additive which is a grafted copolymer further derivatized with at least one amino-aromatic polyamine compound selected from the group consisting of: (a) N-arylphenylenediamine ... (b) aminocarbazole ... (c) aminoindole ... (d) amino-indazolinone ...

and (e) aminoperimidine. Accordingly, amended Claim 21 is believed to be nonobvious, and therefore patentable, over Esche, Jr. et al.

For the foregoing reasons, amended Claims 1-6, 9-14, 17-24, 27-30 and 32-35 are believed to be nonobvious, and therefore patentable, over Esche, Jr. et al. Thus, withdrawal of the rejection is respectfully requested.

The Examiner has rejected Claims 1-15 under 35 U.S.C. §103(a) as being obvious over Migdal et al. U.S. Patent No. 5,075,383 ("Migdal et al.").

As acknowledged by the Examiner, nowhere in Migdal et al. is there any disclosure or suggestion of the specifically recited soot dispersant additive in a diesel fuel composition of amended Claim 1. In contrast to the presently claimed invention, Migdal et al. disclose the use of the additive in a lubricating oil composition and a fuel composition. According to the Examiner, "it would have been obvious to one of ordinary skill in the art to use the additive in diesel fuel because Migdal contemplates using the additive in fuel compositions and this teaching suggests all fuel compositions."

However, one skilled in the art would readily understand that fuel compositions embrace a wide spectrum of fuels such as motor fuels, e.g., gasoline or diesel, kerosene, jet fuels; marine bunker fuel, natural gas, home heating fuel, etc. Moreover, one skilled in the art would further understand that fuel compositions such as gasoline fuels and diesels fuels are totally different fuels and additives will behave different when employed therein. Applicants, however, have surprisingly discovered that the presently recited soot dispersant additive when added to diesel fuel has been found to reach the cylinder lining of a diesel engine prior to fuel combustion and from there to enter the crankcase where they continuously replenish the lubricant's soot

dispersing capability as its original dispersant additive is consumed. This replenishment capability results in the lubricant maintaining its viscometric characteristics over a longer drain interval than would be the case were no soot dispersant additive incorporated into the fuel. In addition to the longer lubricant drain intervals mentioned, operation of a diesel engine with the recited soot dispersant additive-containing fuel has resulted in an unexpected and significant increase in fuel economy which is yet another benefit of employing the diesel fuel composition in the operation of a diesel engine. Certainly, nothing in Migdal et al. would provide any appreciation of this benefit. As such, amended Claims 1-15 are believed to be nonobvious, and therefore patentable, over Migdal et al. Therefore, withdrawal of the rejection is respectfully requested.

The Examiner has rejected Claim 16 under 35 U.S.C. §103(a), as being obvious over Migdal et al. in view of DeCanio U.S. Patent No. 5,925,151 ("DeCanio").

The foregoing deficiencies of Migdal et al. discussed above with respect to the rejection of Claim 1, from which Claim 16 ultimately depends apply with equal force to this rejection. DeCanio does not cure and is not cited as curing the above-noted deficiencies of Migdal et al. Specifically, DeCanio nowhere provides any disclosure or suggestion of the specifically recited soot dispersant additive in a diesel fuel composition of amended Claim 1. Rather, DeCanio is merely cited for the disclosure that a diesel fuel may be a low sulfur diesel fuel. Accordingly, Claim 16 is believed to be nonobvious, and therefore patentable, over Migdal et al. and DeCanio for at least the same reasons above, no matter how these references are considered.

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Amendment to Office Action dated July 13, 2007

For the foregoing reasons, amended Claims 1-35 as presented herein are believed to be in condition for allowance. Such early and favorable action is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael E. Carmen", written in a cursive style.

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